

Contents

Section I Clinical Information Management

Creating Problem Lists and Progress Notes

Capturing Clinical Reports in a Large Academic Medical Center: Feeding a Central Data Repository 2
M.K. Ekstrom, H.F. Orthner, Ph.D., and H.R. Warner, M.D., Ph.D.

Use of Relational Database Management System by Clinicians to Create Automated MICU Progress Note from Existent Data Sources 7
D.P. Delaney, M.D., J.D. Zibrak, M.D., M. Samore, M.D., and M. Peterson

Progress Notes Model 12
H. Aghili, Ph.D., R.A. Mushlin, Ph.D., R.M. Williams, M.S.C.S., and J.S. Rose, M.D.

The Rubber Meets the Road: Integrating the Unified Medical Language System Knowledge Source Server into the Computer-based Patient Record 17
K.B. Johnson, M.D., M.S., and E.B. George, M.D., Ph.D.

Linking Clinical Data

Generic Database Design for Patient Management Information 22
S.B. Johnson, Ph.D., T. Paul, and A. Khenina

Dynamic Link Between ECG and Clinical Data by a CORBA-Based Query Engine and Temporal Mapping 27
C. Wang, M.D., M.S., K. Ohe, M.D., Ph.D., and S. Kaihara, M.D., Ph.D.

Development of an Enterprise-Wide Clinical Data Repository: Merging Multiple Legacy Databases 32
K.W. Scully, M.S., R.D. Pates, Ph.D., G.S. Desper, A.F. Connors, M.D., F.E. Harrell, Jr., Ph.D., K.S. Pieper, M.S., R.L. Hannan, M.D., and R.E. Reynolds, M.D.

CytoBase: An Electronic Medical Record for Cervical Cytology 37
J.K. Golabek, P.Eng., P.J. Brueckner, M.D., and A.M. Seidenfeld, M.D.

Protecting Confidentiality

Data Privacy and Confidentiality in the Public Arena 42
M.E. Mills, Sc.D., R.N.

Design of Access Control Methods for Protecting the Confidentiality of Patient Information in Networked Systems 46
J.W. Bowen, Ph.D., M.S.E.E., J.C. Klimczak, D.V.M., M.S., M. Ruiz, R.N., M.B.A., and M. Barnes, M.D.

Guaranteeing Anonymity When Sharing Medical Data, the Datafly System 51
*L. Sweeney**

*Student Paper Competition Finalist

Innovative Clinical Applications

- A Clinical Data Repository Enhances Hospital Infection Control 56
M. Samore, M.D., D. Lichtenberg, R.N., L. Saubermann, R.P.H., C. Kawachi, M.D., and Y. Carmeli, M.D.

- Knowledge Based Functions for Routine Use at a German University Hospital Setting: The Issue of Fine Tuning 61
T. Bürkle, Dr.Med., H.-U. Prokosch, G. Hussak, and J. Dudeck

- Automatic Stenosis Detection and Quantification in Renal Arteriography 66
I. Cherrak, J.-F. Paul, M.-C. Jaulent, M.D., G. Chatellier, M.D., P.-F. Plouin, M.D., J.-C. Gaux, M.D., Ph.D., and P. Degoulet, M.D., Ph.D.

- Using Software Agents to Maintain Autonomous Patient Registries for Clinical Research 71
S.N. Murphy, M.D., Ph.D., U.H. Rabbani, and G.O. Barnett, M.D.

Ambulatory Care Systems

- Technique for Efficient Information Retrieval in Outpatient Systems 76
J. Marshall, Ph.D., E.A. Balas, M.D., Ph.D., and J.C. Reid, Ph.D.

- Automated Direct-From-Patient Information Collection for Evidence-Based Diabetes Care 81
D.L. Hunt, M.D., R.B. Haynes, M.D., Ph.D., R.S.A. Hayward, M.D., M.P.H., M.A. Pim, R.N., and J. Horsman, B.A.

- An Empirical Study of the Health Status Questionnaire System for Use in Patient-Computer Interaction 86
J. Kim, Ph.D., D. Trace, M.D., K. Meyers, M.D., and M. Evens, Ph.D.

- Clinical Care Management and Workflow by Episodes 91
P.L. Claus, M.D., P.C. Carpenter, M.D., C.G. Chute, M.D., Dr.P.H., D.N. Mohr, M.D., and P.S. Gibbons

Data Modeling and Communications

- Using Logical Observation Identifier Names and Codes (LOINC) to Exchange Laboratory Data Among Three Academic Hospitals 96
D.M. Baorto, M.D., Ph.D., J.J. Cimino, M.D., C.A. Parvin, Ph.D., and M.G. Kahn, M.D., Ph.D.

- Medical Data Mining: Knowledge Discovery in a Clinical Data Warehouse 101
J.C. Prather, M.S., D.F. Lobach, M.D., Ph.D., L.K. Goodwin, R.N., Ph.D., J.W. Hales, Ph.D., M.L. Hage, M.D., and W.E. Hammond, Ph.D.

- A Foundational Model of Time for Heterogeneous Clinical Databases 106
A.K. Das and M.A. Musen, M.D., Ph.D.

- Demystifying Mental Health Information Needs Through Integrated Definition (IDEF) Activity and Data Modeling 111
K.J. Hoffman, M.D., M.P.H.

Designing and Evaluating Clinical Systems

- Evaluating Large Scale Health Information Systems: From Practice Towards Theory 116
H.A. Heathfield, M.Sc., V. Peel, P. Hudson, S. Kay, Ph.D., L. Mackay, Ph.D., T. Marley, L. Nicholson, R. Roberts, and J. Williams

Improving Information Access with an Emergency Department System	121
<i>D. Travers, R.N., M.S.N., and T. Parham, M.S.N., R.N.</i>	

Design of a General Clinical Notification System Based on the Publish-Subscribe Paradigm	126
<i>A. Geissbühler, M.D., J.F. Grande, R.A. Bates, R.A. Miller, M.D., and W.W. Stead, M.D.</i>	

Accuracy and Efficiency of an Automated System for Calculating APACHE II Scores in an Intensive Care Unit	131
<i>V.J. Gooder, R.N., M.S., B.R. Farr, M.D., Ph.D., and M.P. Young, M.D.</i>	

Planning, Outcomes, and Reusability

Nurses' Use of Health Status Data to Plan for Patient Care: Implications for the Development of a Computer-Based Outcomes Infrastructure	136
<i>M.T. Lush, R.N., M.S., and S.B. Henry, R.N., D.N.Sc.</i>	

Documenting 'What Nurses Do'—Moving Beyond Coding and Classification	141
<i>C.N. Mead, M.D., M.S., and S.B. Henry, R.N., D.N.Sc.</i>	

A Patient Workflow Management System Built on Guidelines	146
<i>L. Dazzi, C. Fassino, R. Saracco, S. Quaglini, and M. Stefanelli</i>	

Cross-Institutional Reuse of a Problem Statement Knowledge Base	151
<i>S.H. Brown, M.D., and D.A. Giuse, Dr.Ing.</i>	

Section II Expert Systems and Algorithms

Care Guidelines and Protocols

Structuring Clinical Practice Guidelines in a Relational Database Model for Decision Support on the Internet	158
<i>D.F. Lobach, M.D., Ph.D., M.S., C.S. Gadd, Ph.D., M.B.A., and J.W. Hales, Ph.D.</i>	

Development and Use of a Guideline Entry Wizard to Convert Text Clinical Practice Guidelines to a Relational Format	163
<i>J.W. Hales, Ph.D., C.S. Gadd, Ph.D., M.B.A., and D.F. Lobach, M.D., Ph.D., M.S.</i>	

Inducing Practice Guidelines from a Hospital Database	168
<i>K.C. Abston, M.S., T.A. Pryor, Ph.D., P.J. Haug, M.D., and J.L. Anderson, M.D.</i>	

Decision-Analytic Valuation of Clinical Information Systems: Application to an Alerting System for Coronary Angiography	173
<i>D.S. Bell, M.D.</i>	

Issues in Expert System Design and Implementation

The CLINICon Framework for Context Representation in Electronic Patient Records	178
<i>R. Müller, Dipl. Math.</i>	

Toward Implementation of Artificial Neural Networks That "Really Work"	183
<i>M.A. Leon, M.D., and J. Keller, Ph.D.</i>	

Clinical Event Monitoring at the University of Pittsburgh	188
<i>M.M. Wagner, M.D., Ph.D., M.C. Pankaskie, Ph.D., W. Hogan, M.D., F.-C. Tsui, Ph.D., S. A. Eisenstadt, M.D., E. Rodriguez, M.D., and J.K. Vries, M.D.</i>	

Use of CLIPS for Representation and Inference in a Clinical Event Monitor	193
<i>M.C. Pankaskie, Ph.D., and M.M. Wagner, M.D., Ph.D.</i>	
Pattern Recognition and Knowledge Acquisition from Clinical Data	
Incremental Learning of Probabilistic Rules from Clinical Databases Based on Rough Set Theory	198
<i>S. Tsumoto, M.D., Ph.D., and H. Tanaka, Ph.D.</i>	
Modelling Cardiac Patient Set Residuals Using Rough Sets	203
<i>A. Øhrn, M.Sc., S. Vinterbo, M.Sc., P. Szymański, M.D., and J. Komorowski, Ph.D.</i>	
An Expert-Guided Decision Tree Construction Strategy: An Application in Knowledge Discovery with Medical Databases	208
<i>Y.-S. Tsai, M.S., P.H. King, Ph.D., M.S. Higgins, M.D., D. Pierce, M.D., Ph.D., and N.P. Patel, M.S.</i>	
Prototype Expert System to Assist with the Stabilization of Neonates Prior to Transport	213
<i>L.K. Heermann, R.N., M.S., and C.B. Thompson, R.N., Ph.D.</i>	
Approaches to Systems Evaluation	
Usability Testing in Medical Informatics: Cognitive Approaches to Evaluation of Information Systems and User Interfaces	218
<i>A.W. Kushniruk, M.Sc., V.L. Patel, Ph.D., and J.J. Cimino, M.D.</i>	
Willingness-to-Pay Utility Assessment: Feasibility of Use in Normative Patient Decision Support Systems	223
<i>C.R. Flowers, A.M. Garber, M.D., Ph.D., M.R. Bergen, and L.A. Lenert, M.D., M.S.</i>	
Evaluating the Potential Effectiveness of Using Computerized Information Systems to Prevent Adverse Drug Events	228
<i>J.G. Anderson, Ph.D., S.J. Jay, M.D., M. Anderson, B.A., and T.J. Hunt, B.A.</i>	
The Impact of Anticipatory Patient Data Displays on Physician Decision Making: A Pilot Study	233
<i>R.B. Elson, M.D., M.S., and D.P. Connelly, M.D., Ph.D.</i>	
Knowledge-Based Systems for Clinical Care	
New Computer-Based Tools for Empiric Antibiotic Decision Support	238
<i>H. Warner, Jr., M.S., S.R. Blue, M.D., D. Sorenson, Ph.D., L. Reimer, M.D., L. Li, M.S., M. Nelson, R.N., M. Barton, Pharm.D., and H. Warner, M.D., Ph.D.</i>	
Advanced Alerting Features: Displaying New Relevant Data and Retracting Alerts	243
<i>G.J. Kuperman, M.D., Ph.D., F.L. Hiltz, Ph.D., and J.M. Teich, M.D., Ph.D.</i>	
Evaluation of a Decision Support System for Pressure Ulcer Prevention and Management: Preliminary Findings .	248
<i>R.D. Zielstorff, R.N., M.S., G. Estey, M.Ed., A. Vickery, R.N., M.S., G. Hamilton, R.N., D.N.Sc., J.B. Fitzmaurice, R.N., Ph.D., and G.O. Barnett, M.D.</i>	
Using Data Mining to Characterize DNA Mutations by Patient Clinical Features	253
<i>S. Evans, M.S., S.J. Lemon, M.D., M.P.H., C. Deters, R.N., R.M. Fusaro, M.D., Ph.D., C. Durham, R.N., B.S.N., C. Synder, B.S.N., and H.T. Lynch, M.D.</i>	

Evaluating the Impact of Expert Systems

A Decision Support System for Microbiology Quality Control	258
<i>B.R. Jackson, M.D., * J.D. Schwartzman, M.D., D.E. Zuaro, M.A.T., and E.K. Shultz, M.D.</i>	
Changes in Diagnostic Decision-Making After a Computerized Decision Support Consultation Based on Perceptions of Need and Helpfulness: A Preliminary Report	263
<i>F.M. Wolf, Ph.D., C.P. Friedman, Ph.D., A.S. Elstein, Ph.D., J.G. Miller, G.C. Murphy, Ph.D., P. Heckerling, M.D., P. Fine, M.D., T. Miller, M.D., J. Sisson, M.D., S. Barlas, Ph.D., A. Capitano, M. Ng, and T. Franz</i>	
A Qualitative Study of Clinicians' Ways of Using a Decision-Support System	268
<i>D. Karlsson, M.Sc., C. Ekdahl, M.D., O. Wigertz, D.Sc., D.Med, and U. Forsum, M.D., Ph.D.</i>	
Assessing the Value of Newer Pharmacologic Agents in Non-ST Elevation Patients: A Decision Support System Application	273
<i>E.L. Eisenstein, D.B.A., E.D. Peterson, M.D., M.P.H., J.G. Jollis, M.D., B.E. Tardiff, M.D., R.M. Califff, M.D., J.D. Knight, M.S., and D.B. Mark, M.D., M.P.H.</i>	

Creating Care Guidelines and Protocols

Mixed Integer Programming Optimization Models for Brachytherapy Treatment Planning	278
<i>R.J. Gallagher, Ph.D., and E.K. Lee, Ph.D.</i>	
Operationalization of Clinical Practice Guidelines Using Fuzzy Logic	283
<i>J.C.S. Liu, M.D., and R.N. Schiffman, M.D., M.C.I.S.</i>	
HyperCare: A Prototype of an Active Database for Compliance with Essential Hypertension Therapy Guidelines ..	288
<i>P.V.C. Caironi, L. Portoni, C. Combi, Ph.D., F. Pinciroli, and S. Ceri</i>	
A Prototype Web Site for Immunization Knowledge Maintenance	293
<i>P.L. Miller, M.D., Ph.D., S.J. Frawley, Ph.D., C. Brandt, M.D., M.P.H., and F.G. Sayward, Ph.D.</i>	

Knowledge-Based Clinical Systems

A Temporal Database Mediator for Protocol-Based Decision Support	298
<i>J.H. Nguyen, Y. Shahar, M.D., Ph.D., S.W. Tu, M.S., A.K. Das, and M.A. Musen, M.D., Ph.D.</i>	
Creating an Environment for Linking Knowledge-Based Systems to a Clinical Database: A Suite of Tools	303
<i>A. Wilcox, M.A., G. Hripcsak, M.D., and C. Chen, M.S.</i>	
Towards Improved Knowledge Sharing: Assessment of the HL7 Reference Information Model to Support Medical Logic Module Queries	308
<i>R.A. Jenders, M.D., M.S., W. Sujansky, M.D., Ph.D., C.A. Broverman, Ph.D., and M. Chadwick, B.A.</i>	
Generation of Development Environments for the Arden Syntax	313
<i>M. Bang, M.Sc., and H. Eriksson, Ph.D.</i>	

*Student Paper Competition Finalist

Section III Health Information Networks

Network Applications for Clinical Care

- Experiences in Deployment of a Web-Based CIS for Referring Physicians 320
R. Kittredge, M.D., U. Rabbani, B.S.F. Melanson, and G.O. Barnett, M.D.

- Do Electronic Mail Discussion Lists Act as Virtual Colleagues? 325
E.R. Worth, M.D., M.Ed., and T.B. Patrick, Ph.D.

- Making Effective Referrals: A Knowledge-Management Approach 330
J.S. Einbinder, M.D., M.P.H., D.A. Klein, M.B.A., M.S.E., Ph.D., and C.S. Safran, M.D.

- Practical Lessons in Remote Connectivity 335
A. Kouroubali, J. Starren, M.D., Ph.D., R.C. Barrows, Jr., M.D., and P.D. Clayton, Ph.D.

Secure Telemedicine on the Internet

- Patient-Centered Access to Secure Systems Online (PCASSO): A Secure Approach to Clinical Data Access
Via the World Wide Web 340
D.R. Masys, M.D., and D.B. Baker, Ph.D.

- A Strategy for the Development of Secure Telemedicine Applications 344
R.S. Raman, M.S., M.B.A., R. Reddy, Ph.D., V. Jagannathan, Ph.D., S. Reddy, Ph.D., K.J. Cleetus, Ph.D., and K. Srinivas, Ph.D.

- Virtual Consolidation of Boston's Beth Israel and New England Deaconess Hospitals via the World Wide Web 349
*J.D. Halamka, M.D., * and C. Safran, M.D., M.S.*

- Clinical Communication Among Health Providers and Systems Using Web Tools 354
J.R. Flanagan, M.D., Ph.D., and R.R. Montgomery

'Internetable' Clinical Systems

- The PartnerWeb Project: A Component-Based Approach to Enterprise-Wide Information Integration and Dissemination 359
T.H. Karson, M.D., C. Perkins, C. Dixon, M.S., J.P. Ehresman, G.L. Mamnone, L. Sato, M.D., J.L. Schaffer, M.D., and R.A. Greenes, M.D., Ph.D.

- The Importance of Java and CORBA in Medicine 364
D.W. Forslund, Ph.D., and J.L. Cook, M.D.

- A Virtual Repository Approach to Clinical and Utilization Studies: Application in Mammography as Alternative to a National Database 369
L. Ohno-Machado, M.D., M.H.A., Ph.D., A.A. Boxwala, M.B.B.S., Ph.D., J. Ehresman, D.N. Smith, M.D., M.Sc., and R.A. Greenes, M.D., Ph.D.

- HOLON: A Web-Based Framework for Fostering Guideline Applications 374
B.G. Silverman, Ph.D., K. Moidu, M.D., Ph.D., B.E. Clemente, M.S., L. Reis, M.S., D. Ravichandar, M.S., and C. Safran, M.D., M.S.

*Student Paper Competition Finalist

Telemedicine and Regional Networks

Telemedicine for AIDS Patients Accommodations	379
<i>J.F. Kulik, M.D., X. de la Tribonnière, M.D., N. Bricon-Souf, Ph.D., R.J. Beuscart, M.D., and Y. Mouton, M.D.</i>	
Mobile Telemedicine Testbed	383
<i>D.M. Gagliano, and Y. Xiao, Ph.D.</i>	
A Decentralized, Community-Based Design for Statewide Immunization Registries in Minnesota	388
<i>M. LaVenture, M.P.H., N. Wicklin, R.N., M.S., T. Schillo, M.S., and L. Gatewood, Ph.D.</i>	
Supporting Shared Care for Diabetes Patients: The Synapses Solution	393
<i>P.J. Toussaint, M.Sc., M. Kalshoven, M.Sc., M. Ros, M.Sc., H. van der Kolk, M.Sc., and O. Weier, M.Sc.</i>	

Assessing Telemedicine Systems

Efficacy of Tele-Endoscopy in a Rural Capitated Market	398
<i>P.L. Moses, M.D., J.J. McGowan, Ph.D., and M.A. Ricci, M.D.</i>	
Desktop Teleradiology in Support of Rural Orthopedic Trauma Care	403
<i>J.G. Reid, M.D., J.J. McGowan, Ph.D., M.A. Ricci, M.D., and G. McFarlane</i>	
Evaluation of Clinical Data by Remote Observation in Trauma	408
<i>J.A. Aucar, M.D., R.T. Villavicencio, M.D., M.J. Wall, Jr., M.D., K.R. Liscum, M.D., T.S. Granchi, M.D., and K.L. Mattox, M.D.</i>	
Telematics in the Neonatal ICU and Beyond: Improving Care for High-Risk Newborns and Their Families	413
<i>J. Gray, M.D., M.S., P.C. Jones, M. Phillips, R.N., Ph.D., P. Gertman, M.D., D. Veroff, M.P.P., and C. Safran, M.D., M.S.</i>	

Section IV Images and Nontextual Data

Analyzing and Representing the Content of Images

Application of UMLS Indexing Systems to a WWW-Based Tool for Indexing of Digital Images	420
<i>C. Hatton, J. Woods, Ph.D., R. Dhir, M.D., S. Bastacky, M.D., J. Epstein, M.D., G. Miller, M.D., J. Greenson, M.D., K. Wojno, M.D., and M. Becich, M.D., Ph.D.</i>	
Documenting the Information Content of Images	424
<i>W.D. Bidgood, Jr., M.D., M.S.</i>	
Evaluation of a Visualization-Based Approach to Functional Brain Mapping	429
<i>B. Modayur, Ph.D., R. Jakobovits, M.S., K. Maravilla, M.D., G. Ojemann, M.D., and J. Brinkley, M.D., Ph.D.</i>	

Representation of the Gastrointestinal Endoscopy Minimal Standard Terminology in the SNOMED DICOM Microglossary	434
<i>L.Y. Korman, M.D., and W.D. Bidgood, Jr., M.D., M.S.</i>	

Designing and Evaluating Image Systems

Critical Success Factors for a Hospital-Wide PACS	439
<i>U. Schrader, E. Kotter, E. Pelikan, A. Zaiss, U. Timmermann, and R. Klar</i>	

Acceptability and Usage Patterns of an Image Analysis Workstation	444
<i>A.A. Boxwala, M.B.B.S., Ph.D., C.P. Friedman, Ph.D., D.S. Fritsch, Ph.D., J.G. Rosenman, M.D., Ph.D., and E.L. Chaney, Ph.D.</i>	

The Virtual Microscope	449
<i>R. Ferreira, B. Moon, Ph.D., J. Humphries, Ph.D., A. Sussman, Ph.D., J. Saltz, M.D., Ph.D., R. Miller, M.D., and A. Demarzo, M.D.</i>	

Managing Medical Research Data with a Web-Interfacing Repository Manager	454
<i>R.M. Jakobovits, M.S., and J.F. Brinkley, M.D., Ph.D.</i>	

Measuring and Modeling Anatomic Structures

Automated Measurement of Retinal Vascular Tortuosity	459
<i>W.E. Hart, Ph.D., M. Goldbaum, M.D., B. Côté, M.S., P. Kube, Ph.D., and M.R. Nelson, Ph.D.</i>	

Modeling Mechanical Cardiopulmonary Interactions for Virtual Environments	464
<i>J.M. Kaye, Ph.D.*</i>	

Using 3-D Shape Models to Guide Segmentation of MR Brain Images	469
<i>K.P. Hinshaw, M.S., * and J.F. Brinkley, M.D., Ph.D.</i>	

Automatic Detection of Cardiac Contours on MR Images Using Fuzzy Logic and Dynamic Programming	474
<i>A. Lalande, M.Sc., L. Legrand, Ph.D., P.M. Walker, Ph.D., M.-C. Jaulent, Ph.D., F. Guy, M.D., Y. Cottin, M.D., and F. Brunotte, M.D.</i>	

Section V Information Retrieval and Digital Libraries

Unified Medical Language System Applications

Dynamic Organization of Search Results Using the UMLS	480
<i>W. Pratt, M.S.*</i>	

Query Expansion Using the UMLS Metathesaurus	485
<i>A.R. Aronson, Ph.D., and T.C. Rindfussch, Ph.D.</i>	

MedWeaver: Integrating Decision Support, Literature Searching, and Web Exploration Using the UMLS Metathesaurus	490
<i>W.M. Detmer, M.D., M.Sc., G.O. Barnett, M.D., and W.R. Hersh, M.D.</i>	

A UMLS-Based Method for Integrating Information Databases into an Intranet	495
<i>F. Volot, M.D., M.S., M. Joubert, Ph.D., M. Fieschi, M.D., Ph.D., and D. Fieschi, Ph.D.</i>	

Innovations in Information Retrieval and Display

Standardized Problem List Generation, Utilizing the Mayo Canonical Vocabulary Embedded within the Unified Medical Language System	500
<i>P.L. Elkin, M.D., D.N. Mohr, M.D., M.S. Tuttle, W.G. Cole, Ph.D., G.E. Atkin, K. Keck, T.B. Fisk, B.H. Kaihoi, K.E. Lee, M.C. Higgins, H.J. Suermondt, N. Olson, P.L. Claus, M.D., P.C. Carpenter, M.D., and C.G. Chute, M.D.</i>	

*Student Paper Competition Finalist

The Stanford Health Information Network for Education: Integrated Information for Decision Making and Learning	505
<i>P.R. Hubbs, M.D., M. Tsai, E.E., P. Dev, Ph.D., P. Godin, M.D., J.G. Olyarchuk, M.D., D. Nag, G. Linder, M.S.L.S., M.S., T.C. Rindfleisch, Ph.D., and K.L. Melmon, M.D.</i>	
Puya: A Method of Attracting Attention to Relevant Physical Findings	509
<i>W. Duque de Estrada, M.D., M.S., * S. Murphy, M.D., Ph.D., and G.O. Barnett, M.D.</i>	
Comparing SNOMED and ICPC Retrieval Accuracies Using Relational Database Models	514
<i>Y.A. Lussier, B.Eng., M.D., and M. Bourque, Ph.D.</i>	
New Methods in Information Retrieval	
Conceptual Mapping of User's Queries to Medical Subject Headings	519
<i>Y.L. Zieman, Ph.D., and H.L. Bleich, M.D.</i>	
Virtual Shelves II: A Unified Catalog for a Heterogeneous Collection	523
<i>T.B. Patrick, Ph.D., D. Moxley, M.A., G.K. Allen, D.V.M., Ph.D., J. Anderson, M.A., and S. Kuster, M.A.</i>	
Supporting Infobuttons with Terminological Knowledge	528
<i>J.J. Cimino, M.D., G. Elhanan, M.D., and Q. Zeng, M.S.</i>	
A Method for Representing Search Results in Three Dimensions	533
<i>M.H. Miller</i>	
Wide-Area Information Retrieval via the Internet	
A Java-Based Multi-Institutional Medical Information Retrieval System	538
<i>K. Wang, Ph.D., F.J. van Wingerde, drs., K. Bradshaw, M.D., P. Szolovits, Ph.D., and I. Kohane, M.D., Ph.D.</i>	
Internet Access to a Medical Case Repository for Teaching and Analysis	543
<i>H. Kindler, Ph.D., T.M. Fliedner, M.D., and D. Densow, M.D.</i>	
The Healthcare Administrator's Associate: An Experiment in Distributed Healthcare Information Systems	548
<i>J. Fowler, Ph.D., and G. Martin, Ph.D.</i>	
Linking a Clinical System to Heterogeneous Information Resources	553
<i>Q. Zeng, M.S., and J.J. Cimino, M.D.</i>	
Section VI Standards and Policy	
Toward Controlled Clinical Vocabulary	
Conducting the NLM/AHCPR Large Scale Vocabulary Test: A Distributed Internet-Based Experiment	560
<i>A.T. McCray, Ph.D., M.L. Cheh, A.K. Bangalore, K. Rafei, A.M. Razi, G. Divita, and P.Z. Stavri</i>	
Department of Veterans Affairs, University of Utah Consortium Participation in the NLM/AHCPR Large Scale Vocabulary Test	565
<i>J.C. Eagon, M.D., E. Ortiz, M.D., K.A. Zollo, M.D., J. Hurdle, M.D., Ph.D., and M.J. Lincoln, M.D.</i>	
A Clinically Derived Terminology: Qualification to Reduction	570
<i>C.G. Chute, M.D., Dr.P.H. and P.L. Elkin, M.D.</i>	

*Student Paper Competition Finalist

WWW-Available Conceptual Integration of Medical Terminologies: The ONIONS Experience	575
<i>D.M. Pisanelli, A. Gangemi, and G. Steve</i>	

Natural Language Processing

Assessing the Feasibility of Large-Scale Natural Language Processing in a Corpus of Ordinary Medical Records: A Lexical Analysis	580
<i>W.R. Hersh, M.D., E.M. Campbell, R.N., M.S., and S.E. Malveau, M.S.</i>	

Corpus-Based Identification and Refinement of Semantic Classes	585
<i>A. Nazarenko, Ph.D., P. Zweigenbaum, Ph.D., J. Bouaud, Ph.D., and B. Habert, Ph.D.</i>	

Evaluating a Normalized Conceptual Representation Produced from Natural Language Patient Discharge Summaries	590
<i>P. Zweigenbaum, Ph.D., J. Bouaud, Ph.D., B. Bachimont, Ph.D., J. Charlet, Ph.D., and J.F. Boisvieux, M.D., Ph.D.</i>	

Towards a Comprehensive Medical Language Processing System: Methods and Issues	595
<i>C. Friedman, Ph.D.</i>	

Managing Vocabulary Change and Expansion

Maintaining the Integrity of a Web-Based Medical Vocabulary Glossary	600
<i>R.M. Aryel, M.D., J. Cai, M.S., H.C. Chueh, M.D., M.S., and G.O. Barnett, M.D.</i>	

Development of a Change Model for a Controlled Medical Vocabulary	605
<i>D.E. Oliver, M.D., and Y. Shahar, M.D., Ph.D.</i>	

Terminological Systems: Bridging the Generation Gap	610
<i>J.E. Rogers, M.R.C.G.P., and A.L. Rector, Ph.D., M.D.</i>	

Semantic Quality through Semantic Definition: Refining the Read Codes through Internal Consistency	615
<i>E.B. Schulz, M.B.B.S., J.W. Barrett, M.Sc., M.B.B. Chir, and C. Price, M.Phil.</i>	

Concept Modeling and Representation

Compositional and Enumerative Designs for Medical Language Representation	620
<i>A.M. Rassinoux, Ph.D., R.A. Miller, M.D., R.H. Baud, Ph.D., and J.-R. Scherrer, M.D.</i>	

Formative Evaluation of a Frame-Based Model of Locative Relationships in Human Anatomy	625
<i>C.A. Bean, Ph.D., M.L.S</i>	

Partitioning a Vocabulary's IS-A Hierarchy into Trees	630
<i>H. Gu, M.S., Y. Perl, Ph.D., J. Geller, Ph.D., M. Halper, Ph.D., J.J. Cimino, M.D., and M. Singh, M.S.</i>	

SGML as a Message Interchange Format in Healthcare	635
<i>R.H. Dolin, M.D., L. Alschuler, T. Bray, and J.E. Mattison, M.D.</i>	

Standards for Medical Terminology

- SNOMED RT: A Reference Terminology for Health Care** 640
K.A. Spackman, M.D., Ph.D., K.E. Campbell, M.D., Ph.D., and R.A Côté, M.D., D.Sc. (Hon.)

- Evaluating the Terminology Requirements to Support Multi-disciplinary Diabetes Care** 645
P.J.B. Brown, M.R.C.G.P., C. Price, and P.H. Sonksen, M.D.

- Conceptual Schemata for Terminology: A Continuum from Headings to Values in Patient Records and Messages** 650
A. Rossi Mori, E. Galeazzi, F. Consorti, and W.D. Bidgood, Jr., M.D., M.S.

- Expressiveness of the Breast Imaging Reporting and Database System (BI-RADS)** 655
J. Starren, M.D., Ph.D., and S.M. Johnson, Ph.D.

Section VII Training, Education, and Cognitive Science

Overview of Training, Education and Cognition

- Teaching Skills for Accessing and Interpreting Information from Systematic Reviews/Meta-analyses, Practice Guidelines, and the Internet** 662
F.M. Wolf, Ph.D., J.G. Miller, L.D. Gruppen, Ph.D., and W.D. Ensminger, M.D.

- A Decision Analytic Method for Scoring Performance on Computer-Based Patient Simulations** 667
S.M. Downs, M.D., M.S., C.P. Friedman, Ph.D., F. Marasigan, and G. Gartner, M.D.

Training and Information Management in Clinical Settings

- Meeting the Information Needs of Patients: Results from a Patient Focus Group** 672
P.C. Tang, M.D., C. Newcomb, M.H.S.A., S. Gorden, and N. Kreider, R.N.

- Implementing Computers in Ambulatory Care: Implications of Physician Practice Patterns for System Design** 677
C.E. Aydin, Ph.D., and D.E. Forsythe, Ph.D.

- Factors Affecting the Diffusion of the Computer-Based Patient Record** 682
J.S. Ash, Ph.D., M.L.S., M.B.A.

- Improving Information Management in Family Practice: Testing an Adult Learning Model** 687
S. Teasdale, P.C.M., P.C.C.A., and M. Bainbridge, B.M.B.S., M.R.C.G.P.

Evolving Technology in Training and Education

- E-mail Access to NetCME: Implementation of Server Push Paradigm** 693
K.W. McEnergy, M.D., and J.E. Grossman, M.B.A.

- Performance Support Concepts for Web-Based Informatics Instruction** 698
L. Goodwin, R.N., Ph.D.

- Implementing Cognitive Learning Strategies in Computer-based Educational Technology: A Proposed System** 703
M.J. Wang, M.A., P.B. Contino, M.A., and E.S. Ramirez

The Development and Evaluation of an Adaptable Computer Aided Instruction (CAI) Program for Acquiring Problem Solving Skills in Biochemistry on the WWW: The "BioChem" Thinker	708
<i>B. Hershkovitz</i>	

Section VIII User Interface Issues

Innovations in User Interface Design

Probabilistic Predictions of Penetrating Injury to Anatomic Structures	714
<i>O. Ogunyemi, M.S.E., B. Webber, Ph.D., and J.R. Clarke, M.D.</i>	

Controlled Vocabulary and Design of Laboratory Results Displays	719
<i>G. Elhanan, M.D., and J.J. Cimino, M.D.</i>	

Word Frequency Analysis of Dictated Clinical Data: A User-Centered Approach to the Design of a Structured Data Entry Interface	724
<i>C.W. Kreis* and P. Gorman, M.D.</i>	

Lightweight, Mobile E-Mail for Intra-Clinic Communication	729
<i>R.D. Acuff, L.M. Fagan, M.D., Ph.D., T.C. Rindfleisch, M.S., B.J. Levitt, and P.M. Ford, M.D.</i>	

Human Factors in Interface Design

Integrating Communicative Goals for Real-Time Clinical Decision Support	734
<i>S. Carberry, Ph.D., T. Harvey, M.S., and J.R. Clarke, M.D.</i>	

Acceptance of a Speech Interface for Biomedical Data Collection	739
<i>M.A. Grasso, Ph.D., D. Ebert, Ph.D., and T. Finin, Ph.D.</i>	

Iterative Usability Testing: Ensuring a Usable Clinical Workstation	744
<i>J.M. Coble, M.S., J. Karat, Ph.D., M.J. Orland, M.D., and M.G. Kahn, M.D., Ph.D.</i>	

The Availability of Unavailable Information	749
<i>M.M. Kuilboer, M.D., M.Sc., J. van der Lei, M.D., Ph.D., A.M. Bohnen, M.D., Ph.D., and J.H. van Bemmel, Ph.D.</i>	

Issues in Implementation of WWW-based Clinical Information Systems

Design Considerations in Migrating an Obstetrics Clinical Record to the Web	754
<i>D.A. Berkowicz, M.D., M.Sc., M.S., H.C. Chueh, M.D., M.S., and G.O. Barnett, M.D.</i>	

Experiences with ARTEMIS—An Internet-Based Telemedicine System	759
<i>S. Reddy, Ph.D., M. Niewiadomska-Bugaj, Ph.D., Y.V. Reddy, Ph.D., H.C. Galfalvy, M.S., V. Jagannathan, Ph.D., R. Raman, M.S., K. Srinivas, Ph.D., R. Shank, M.S., T. Davis, M.S., S. Friedman, M.D., B. Merkin, M.D., and M. Kilkenny, M.D.</i>	

Implementing NCEP Guidelines in a Web-Based Disease-Management System	764
<i>F.C. Tsui, Ph.D., M. Wagner, M.D., Ph.D., and M.E. Thompson, M.D.</i>	

SecondOpinion: Interactive Web-Based Access to a Decision Model	769
<i>G.C. Scott, D.J. Cher, M.D., and L.A. Lenert, M.D.</i>	

*Student Paper Competition Finalist

Innovations in User Interface Design II

- SAM: Speech-Aware Applications in Medicine to Support Structured Data Entry 774
A.K. Wormek, D.V.M., J. Ingenerf, Ph.D., and H.F. Orthner, Ph.D.

- Can Data Representation and Interface Demands Be Reconciled? Approach in ORCA 779
A.M. van Ginneken, M.D., Ph.D., M. de Wilde, E.M. van Mulligen, Ph.D., and H. Stam

- Preserving Context in a Multi-Tasking Clinical Environment: A Pilot Implementation 784
D.F. Sittig, Ph.D., J.M. Teich, M.D., Ph.D., J.A. Yungton, and H.C. Chueh, M.D.

- Data Collection and Information Presentation for Optimal Decision Making by Clinical Managers—
The Autocontrol Project 789
A.M. Grant, M.D., Ph.D., Y. Richard, M.Sc., E. Deland, M.D., N. Despres, Ph.D., F. de Lorenzi, Ph.D., A. Dagenais, and M. Buteau, D.Sc.

WWW Interfaces to Healthcare Data

- Web-Based Data Integration and Annotation in the Intensive Care Unit 794
P.R. Norris, M.S., B.M. Dawant, Ph.D., and A. Geissbuhler, M.D.

- Web Client and ODBC Access to Legacy Database Information: A Low Cost Approach 799
N.W. Sanders, M.S., N.H. Mann III, Ph.D., and D.M. Spengler, M.D.

- Electronic Forms: Benefits and Drawbacks of A World Wide Web-Based Approach to Data Entry 804
S.N. Luxenberg, M.D., D.D. DuBois, C.G. Fraley, M.A., R.R. Hamburg, M.A., X.L. Huang, M.S., and P.D. Clayton, Ph.D.

- Meeting Clinician Information Needs by Integrating Access to the Medical Record and Knowledge Resources via the Web 809
P. Tarczy-Hornoch, M.D., T.S. Kwan-Gett, M.D., L. Fouche, J. Hoath, Ph.D., S. Fuller, Ph.D., K.N. Ibrahim, D.S. Ketchell, M.L., J.P. LoGerfo, M.D., and H.I. Goldberg, M.D.

Applications of Natural Language Processing

- A Natural Language Parsing System for Encoding Admitting Diagnoses 814
P.J. Haug, M.D., L. Christensen, M. Gundersen, M.S., B. Clemons, S. Koehler, and K. Bauer

- Text Structures in Medical Text Processing: Empirical Evidence and a Text Understanding Prototype 819
U. Hahn and M. Romacker

- Searching for Information on the Internet Using the UMLS and Medical World Search 824
H.H. Suarez, M.D., Ph.D., X. Hao, Ph.D., and I.F. Chang, Ph.D.

- Identification of Findings Suspicious for Breast Cancer Based on Natural Language Processing of Mammogram Reports 829
N.L. Jain, D.Sc., and C. Friedman, Ph.D.

Section IX Papers Presented as Posters

This section contains one-page summaries of papers for which the full-length paper is available on the CD-ROM Extended Proceedings)

Visualization of Electrocardiogram and Heartrate	836
<i>U.R. Acharya and U.C. Niranjan</i>	
Domain Modeling with Integrated Ontologies: Principles for Reconciliation and Reuse	837
<i>A. Advani, M.D., M.P.H., S.W. Tu, M.S., and M.A. Musen, M.D., Ph.D.</i>	
Web/Java-Based Access to and Analysis of a Library of Clinical Outcomes Databases	838
<i>L.B. Afrin, M.D.</i>	
ODACoDec. Coder-Decoder for Multimedia Documents Based on the ODA Standard (ISO-8613)	839
<i>J.L. Arrieta, M.T. Morales, F.J. Moreno, and C.H. Salvador</i>	
A Cytogenetics Information System for Automating Quality Assurance and Quality Improvement Documentation in the Clinical Laboratory	840
<i>A.L. Asare, J.C. Klimczak, D.V.M., M.S., and C.W. Caldwell, M.D., Ph.D.</i>	
Validation of Concept Representation Using Natural Language Generation	841
<i>R. Baud, Ph.D., J.M. Rodrigues, M.D., J.C. Wagner, A.M. Rassinoux, Ph.D., C. Lovis, M.D., P. Rush, Ph.D., B. Trombert-Paviot, M.D., and J.R. Scherrer, M.D.</i>	
Physician Use of Interactive Functions in Diagnostic Decision Support Systems	842
<i>E.S. Berner, Ed.D., and R.S. Maisiak, Ph.D., M.S.P.H.</i>	
Reliability Issues in Coding Encounters in Primary Care Using an ICPC/ICD-10-based Controlled Clinical Terminology	843
<i>R.M. Bernstein, Ph.D., M.D.C.M., G.R. Hollingworth, M.D., G. Viner, M.D., J. Shearman, M.B.B.S., C. Labelle, M.D., and R. Thomas, Ph.D., M.D.</i>	
Distributed Reuse of Knowledge in a Computerized Decision Support System for Bone-Marrow Post-Transplant Care Over the World Wide Web	844
<i>I. Bichindaritz, Ph.D., J.M. Bradshaw, Ph.D., and K.M. Sullivan, M.D.</i>	
Building a Normalized Conceptual Representation of Medical Language: A Semantic Composition Method Driven by Domain Knowledge Models	845
<i>J. Bouaud, Ph.D., P. Zweigenbaum, Ph.D., and B. Bachimont, Ph.D.</i>	
Using Coded Semantic Relationships to Retrieve and Structure Clinical Reference Information	846
<i>C.A. Brandt, M.D., M.P.H., L.A. Fernandes, M.D., S.M. Powsner, M.D., K.J. Ruskin, M.D., and P.L. Miller, M.D., Ph.D.</i>	
Nursing Practice Models: Implications for IS Design	847
<i>P.F. Brennan, R.N., Ph.D., and M. Anthony, R.N., Ph.D.</i>	
Learning Conditional Probabilities for Dynamic Influence Structures in Medical Decision Models	848
<i>C. Cao, Ph.D., and T.Y. Leong, Ph.D., M.S.</i>	
Adapting Clinical Coding Systems for the Computer-Based Patient Record	849
<i>H.L. Chin, M.D., M.A. Krall, M.D., and S. Lester, M.D.</i>	

A Telemedicine System Using B-ISDN .....	.850
<i>J. Choi, Ph.D., Y. Kim, Ph.D., S. Lee, Ph.D., J. Lee, B. Oh, and H. Cho</i>	
Modeling and Performance Evaluation of "Continuity" in a Representative Staff Model Health Maintenance Organization .....	.851
<i>R. Citro, S. Ghosh, Ph.D., and P.G. Churgin, M.D.</i>	
Clinical Testing of a National Standardized Minimum Data Set Designed to Capture the Management Context of Health Care Delivery .....	.852
<i>C.W. Delaney, Ph.D., R.N., and D.G. Huber, Ph.D., R.N.</i>	
Comparing Complex Diagnoses: A Formative Evaluation of the Heart Disease Program .....	.853
<i>H.S. Fraser, M.B.Ch.B., M.Sc., W.J. Long, Ph.D., and S. Naimi, M.D.</i>	
Toward the Systematic Maintenance of Different Versions of Rule-Based Immunization Guideline Logic .....	.854
<i>S.J. Frawley, Ph.D., P.L. Miller, M.D., Ph.D., F.G. Sayward, Ph.D., and W.A. Yasnoff, M.D., Ph.D.</i>	
Decision-Support Systems Designed for Critical Care .....	.855
<i>M. Frize, P. Eng., H.C.E. Trigg, F.G. Solven, M.D., M. Stevenson, Ph.D., and B.G. Nickerson, Ph.D.</i>	
The Impact of Workflow Management Systems on the Design of Hospital Information Systems .....	.856
<i>S. Graeber, M.D.</i>	
Appreciation of the Need for Informatics Support in Applied Clinical Research .....	.857
<i>A.M. Grant, M.D., Ph.D., E. Delisle, M.Sc., D. Perras, M.Sc., M. Beteau, D.Sc., and M. Xhignesse, M.D., M.Sc.</i>	
Improved Nomenclature Efficiency Using Data Proposition Hierarchy .....	.858
<i>E.M. Herrold, M.D., Ph.D., and P.S. Goltra, B.S.E.E.</i>	
Extraction of Medical Information from Textual Sources: A Statistical Variant of the Boundary Word Method ..	.859
<i>T.W. Herzig, M.S.H.I., and M. Johns, Ph.D.</i>	
Redesign of a Utilization Review Department Using Information Technology as a Tool .....	.860
<i>S. Hinckley-Bocchino, J. Coakley, L.P.N., M.Ed., M. Messmer, R.N., and S.J. Sullivan, M.D.</i>	
The Medical Web Project .....	.861
<i>D.R. Horner, and S.I. Sayegh, M.D., Ph.D.</i>	
Organizing Slovene Medical Bibliography on the World Wide Web .....	.862
<i>D. Hristovski, M.Sc., and A. Rozic-Hristovski, M.D., M.Sc.</i>	
Does Net-Based Education Help Students?: Usage of New Resources .....	.863
<i>M.P. Hutchens, M.A., P.M. Kuehl, and D. Mallott, M.D.</i>	
Web-Based Tutorial Training for a Regional Network of Clinical Providers .....	.864
<i>R.A. Kanten-McCoy, M.B.A., M.S.N., R.N., and J.R. Flanagan, M.D., Ph.D.</i>	
Preliminary Findings from an Evaluation of the Acceptability of an Expert System .....	.865
<i>B. Kaplan, Ph.D., R.A. Morelli, Ph.D., and J.W. Goethe, M.D.</i>	
Web Based Parallel/Distributed Medical Data Mining Using Software Agents .....	.866
<i>H. Kargupta, Ph.D., B. Stafford, and I. Hamzaoglu, M.S.</i>	

Self-Assessment and Formative Evaluation of an Integrated Clinical Work Station Project	867
<i>S. Kay, Ph.D., A. Jones, D. Hagger, T. Marley, and H.A. Heathfield, Ph.D.</i>	
Pattern-Based OCX Components for the Electronic Patient Record	868
<i>B.F. Leão, M.D., Ph.D., P.J. Madril, E.A. Mendonça, M.D., P.R. Lopes, M., and D. Sigulem, M.D., Ph.D.</i>	
An Education-Based Approach to Promote Population Health and Patient Awareness	869
<i>K.J. Leonard, Ph.D., and A. Grant, M.D., D.Phil</i>	
Comparing the Performance of Mathematical Models for Surgical Decisions on Head Injury Patients	870
<i>Y.C. Li, M.D., Ph.D., L. Liu, Ph.D., T.F. Yang, M.D., Ph.D., and W.T. Chiu, M.D., Ph.D.</i>	
An Investigation of the Information Seeking Behavior of Medical Oncologists in Metropolitan Pittsburgh Using a Multimethod Approach	871
<i>E.C. Lomax, M.L.S., H.J. Lowe, M.D., and T.F. Logan, M.D.</i>	
Collecting and Interpreting Temporal Data in an Expert System	872
<i>W.J. Long, Ph.D., H.S. Fraser, M.B.Ch.B., M.Sc., S. Naimi, M.D., and J. Stahl, M.D.</i>	
Morphosemantems Decomposition and Semantic Representation to Allow Fast and Efficient Natural Language Recognition	873
<i>C. Lovis, M.D., R. Baud, Ph.D., P.A. Michel, and J.R. Scherrer, M.D.</i>	
SERCULATE: A CPR Developed for an Exercise Rehabilitation Research Facility	874
<i>R. Manchanda, M.S., K. Canfield, Ph.D., M.J. Rosen, Ph.D., G. Kairis, M.S., R.N., P.A. Abbott, M.S., R.N.C., and D.D. Bradham, Dr.P.H.</i>	
Differential Diagnosis of Dementia: A Knowledge Discovery and Data Mining (KDD) Approach	875
<i>S. Mani, M.B.B.S., M.S., W.R. Shankle, M.D., M.S., M.J. Pazzani, Ph.D., P. Smythe, Ph.D., and M.B. Dick, Ph.D.</i>	
About the Role Played by Time in the Perception of Usefulness and Ease of Use by the Users of a Clinical Information System	876
<i>M.C. Mazzoleni, Dr.Ing., P. Baiardi, Dr. Math., I. Giorgi, Dr.Psyc.Sc., G. Franchi, P.I., R. Marconi, and M. Cortesi</i>	
The Coupler Conundrum - A Baseline Pilot Study: Decision Making and Ambiguity in Primary Care	877
<i>J.J. McGowan, Ph.D., P. Winstead-Fry, Ph.D., S. Parrish, R.N., L. Weisman, M.D., R. Bernstein, M.D., and M. Douglas, R.N.</i>	
Reducing Acute Care Using a Community Care Coordination Network	878
<i>W.P. Moran, M.D., M.S., C.H. Messick, M.D., J.L. Wofford, M.D., J.S. Preisser, Ph.D., G.J. Chen, M.D., Ph.D., A. Sheehan, R.N., D.L. Currin, G. Russell, M.S., M. Wright, and R. Velez, M.D., M.Sc.</i>	
Implementation of Portable Decision Support Using the W3-EMRS Architecture	879
<i>D.J. Nigrin, M.D.</i>	
INFOVIDA - A Health Information Server in the WWW	880
<i>M.A. Novaes, Ph.D., M.T. Moura, M.D., P. Porto, M.D., and C.S.F. Mesquita, M.D.</i>	
A Web-Based Mumps Virtual Machine	881
<i>K.C. O'Kane, Ph.D., and E.E. McColligan, M.P.H., M.S.</i>	

A Multimedia Medical Textbook on a Satellitic Network System	882
<i>Y. Okada, M.D., Y. Haruki, Y. Ogushi, Y. Ohta, Y. Hayashi, H. Kimura, Ohata, T. Kon, H. Mizuno, M. Horie, I. Endo, J. Oshima, and H. Tashiro</i>	
Methods for Evaluating Inter-Rater Agreement During the NLM/AHCPR Large Scale Vocabulary Test	883
<i>E. Ortiz, M.D., M.P.H., J.C. Eagon, M.D., M.S., and M.J. Lincoln, M.D.</i>	
Multiple Attributes for Patient Care Data: Toward a Multiaxial, Combinatorial Vocabulary	884
<i>J.G. Ozbolt, Ph.D., R.N.</i>	
Design and Implementation of a World Wide Web Accessible Database for the Swedish ICD-10 Primary Care Version Using a Concept System Approach	885
<i>H. Petersson, M.Sc., G. Nilsson, M.D., H. Ahlfeldt, Ph.D., B. Malmberg, M.D., and O. Wigertz, D.Sc., D.Med.</i>	
TempoRenal: A Web-Oriented Knowledge-Based System for Renal Monitoring in an Intensive Care Unit	886
<i>S.E. Schleuterman, M.S., B. Heindl, Dr.med., B. Pollwein, Dr.med., and U. Finsterer, Dr.med.</i>	
Going Paperless: Can It Be Done?	887
<i>D.Z. Sands, M.D., M.P.H., D.M. Rind, M.D., M.S., C. Vieira, and C. Safran, M.D., M.S.</i>	
SEURAT: Scanned Entry of Structured Data for a Pediatric Health Maintenance Record System	888
<i>R.N. Shiffman, M.D., M.C.I.S., C.A. Brandt, M.D., M.P.H., M. Hoffman, R.N., M.S., W. Wiig, M.I.S., and L.A. Fernandes, M.D.</i>	
Surgical Asset Management System	889
<i>D.K. Sorenson, Ph.D., C.K. Tesch, R.N., M.B.A., and J. Fuller, R.N.</i>	
Observational Studies of a Trauma Care Team in Support of Interface Design	890
<i>B. Spejewski, Ph.D.</i>	
Semantic Indexing for Complex Patient Grouping	891
<i>K. Stoffel, Ph.D., J. Saltz, Ph.D., J. Hender, Ph.D., J. Dick, Ph.D., W. Merz, Ph.D., and R. Miller, Ph.D.</i>	
Clinical Vocabularies - Their Potential as Classifications	892
<i>C.D.G. Stuart-Buttle, M.B.B.S., J.S.A. Ashley, and M. O'Neil, M.B.B.S.</i>	
Clinical-Mate: A Manager of Temporal Databases for Clinical Applications	893
<i>P. Terenziani, V. Brusoni, L. Console, F. Molino, G. Molino, and E. Nicolosi</i>	
Reducing False Alarms in the Intensive Care Unit: A Systematic Comparison of Four Algorithms	894
<i>C.L. Tsien, S.M.</i>	
The Evolution of a Cardiology Information System: From Mainframe to Web	895
<i>C.T. Tumey, M.S., and M.R. Kohls, M.S.</i>	
A Textual Information Detection and Elimination System for Secure Medical Image Distribution	896
<i>J.Z. Wang, M.S., M.S.C., M. Bilello, Ph.D., and G. Wiederhold, Ph.D.</i>	
Organization and Functional Features of a Multi-Disciplinary Problem List in an Enterprise-Wide Computer-Based Patient Record	897
<i>J.J. Warren, Ph.D., R.N., S.D. Flach, M.D., J. Lazure, R.N., C. Sorrentino, R.N., and J.R. Campbell, M.D.</i>	

Section X Posters

Critical Care Decision Support System	900
<i>J.I. Adibi, R.S. Patil, Ph.D., and W.C. Shoemaker, M.D.</i>	
Low-Cost Telepsychiatry for the Deaf in South Carolina	901
<i>J.N. Afrin, M.D., and A.B. Critchfield, Ph.D.</i>	
Web-Based Clinical Trials Information for Patients: An Accrual Aid?	902
<i>L.B. Afrin, M.D., J.R. Gentry, M.A., and R.K. Stuart, M.D.</i>	
Digital Signatures for Patient Documents Delivered via the WWW	903
<i>G.K. Allen, D.V.M., Ph.D., D.M. Witten, and T.B. Patrick, Ph.D.</i>	
A Proposal for Using Metadata Encoding Techniques for Health Care Information Indexing on the WWW	905
<i>R.J. Appleyard, Ph.D., and G. Malet, D.O.</i>	
Does a Computer-Based System Help Researchers in Medical Genetics to Perform Familial Studies Without Manipulating Nominal Data?	906
<i>S. Arsenault, and D. Gaudet, M.D.</i>	
A Neural Network Model to Predict Iron-Deficiency Anemia in Hemodialyzed Patients	907
<i>P. Baiardi, V. Piazza, M.D., G. Montagna, M.D., G. Franchi, P.I., M. Cortesi, P.I., and M.C. Mazzoleni, Dr.Ing.</i>	
Distributed Database Management for an Obstetrical Service: The BabyTracker Experience	908
<i>I. Benjamin, M.D., S. Cashon, M.A. Morgan, M.D., V.M. Roberts, M.B.A., and M.T. Mennuti, M.D.</i>	
Applying ASTM E31 Standard Guidelines for Modeling the Sao Paulo University Hospital Computerized Medical Record: Comparing the Real World with the E1384-96 Described Standard Model	909
<i>M. Biczyk do Amaral, M.D., Ph.D., R. Hartmann, M. Nascimento, M.Sc., L. Moura, Ph.D., M. Novaes, Ph.D., and E. Massad, M.D., Ph.D.</i>	
Electronic Mail Consultations in Pediatrics Across the World Wide Web: An 18 Month Experience	910
<i>S.M. Borowitz, M.D.</i>	
Development and Implementation of a WWW-Based Database of Teaching Images	911
<i>S.M. Borowitz, M.D., J. Jackson, M.S., V. Chalasani, Ph.D., and N. Ellero, M.S.</i>	
A Web-Based People Information Retrieval System	912
<i>J.S. Boswell, Ph.D., and D. Giuse, Dr.Ing.</i>	
A Neural-Network Based System on the World Wide Web for Prognosis and Indication of Surgery in Head and Brain Trauma	913
<i>M.L.A. Botelho, L. Araujo, M.D., and R.M.E. Sabbatini, Ph.D.</i>	
Usability Evaluation of an On-Line Nursing Assessment	914
<i>P.Q. Bourie, M.S., R.N., J. Dresch, R.N., and R.H. Chapman, M.S., R.N.</i>	

ORCAS: Network-Based Management of Cancer Clinical Trials .....	.915
<i>R. Brodner, M.S.W., W. Hersh, M.D., M. Helfand, M.D., and E. Brown</i>	
HEALNet Clinical Theme: Evidence-Based Solutions for Health Care Problems .....	.916
<i>M.C. Brouwers, Ph.D., E.A. Murray, and R.B. Haynes, M.D., Ph.D.</i>	
Patient Language - Evaluating its Relationship to a Clinical Thesaurus .....	.917
<i>P.J.B. Brown, M.R.C.G.P., C. Price, and Y. Cox, R.G.N., M.B.A.</i>	
GALILEO: An 'Internetable' Knowledge Source .....	.918
<i>H.S. Buchanan, Ed.D., M.Ln., M.B.A., L.L. Jerant, M.Lib., and J. Dennison, M.L.</i>	
An Effective Evaluation Process for Proposed Information Integration Projects Developed Under IAIMS at the City of Hope .....	.919
<i>O.S. Butler, M.A., W.S. Nobel, T. Odom-Maryon, Ph.D., and J.C. Niland, Ph.D.</i>	
Maximizing Community Physicians' Readiness for Clinical System Implementation .....	.920
<i>L.P. Caillouet, Ph.D.</i>	
Brain & Mind Magazine: An On-Line Multimedia Resource for Dissemination and Evaluation of Knowledge in Neuroscience .....	.921
<i>S.H. Cardoso, Ph.D., and R.M.E. Sabbatini, Ph.D.</i>	
Incorporating the Family into the Electronic Medical Record System with a Relational Database Design .....	.922
<i>T.J. Chen, Dr.med.</i>	
Evidence-Based Medicine for Patients: A Meta-Analysis of Trials of Terazosin for Benign Prostatic Hyperplasia .....	.923
<i>D.J. Cher, M.D., and L.A. Lenert, M.D., M.S.</i>	
A Java-Based WWW Client/Server Prototype for Distributed Cardiac SPECT Data Processing .....	.924
<i>P.C. Chiao, Ph.D., E.P. Ficaro, Ph.D., and N.H. Clinthorne, M.S.</i>	
MEDMANAGER: Knowledge-Based Medical Telenetworking with Image-Based Access to Clinical Data and Knowledge .....	.925
<i>C. Chizzali-Bonfadini, M.Sc., K.P. Adlassnig, Ph.D., C. Schuh, M.Sc., K. Boegl, M.Sc., and G. Kolousek, Ph.D.</i>	
Point-and-Click Patient Information System for Sabah Hospital, Kuwait .....	.926
<i>M.H. Choudhury, M.S., S. Khalifa, and I. Barghash, M.D.</i>	
Making Material Safety Data Sheets Available on the Corporate Intranet .....	.927
<i>M.D. Clark, M. Hadzikadic, Ph.D., and K.H. Gebhart</i>	
Implementation of Clinical Practice Guidelines by the Use of World Wide Web Format Connected to Direct Physician Order Entry .....	.928
<i>N.A. Coblio, M.T. McCormick, M.S., A. Malek, M.D., and W.S. Harris, M.D.</i>	
The Digital Formulary: Development of an Intranet Drug List for a University Hospital .....	.929
<i>J.B. Cohen, N. Allee, J. Bonasso, Pharm.D., D. Chudnov, J. Chung, B. Jakub, L.M. Nickle, M.S., and J.P. Williams</i>	
Retrospect: A Hybrid Decision Support System in the Domain of Breast Cancer Treatment Planning .....	.930
<i>J.B. Cohen</i>	

Metaphrase: Achieving Formalized EMR Problem Lists from Informal Input .....	.931
<i>W.G. Cole, Ph.D., D.D. Sheretz, M.S. Tuttle, K.D. Keck, N.E. Olson, C.G. Chute, M.D., Dr. P.H., and C. Safran, M.D.</i>	
Build It So They Will Come...A World Wide Web Server Within the VA's DHCP System for the Delivery of Clinical Data .....	.932
<i>M.R. Cox, D.K. Martin, M.D., P.L. Salmon, M.T., and J.R. Roskam, M.D.</i>	
Back to Basics: Focusing on Fundamental Physician Views of Clinical Data .....	.933
<i>D.E. Dietzman, and O.W. Mason, M.D.</i>	
Delivering the Goods: Internet Delivery of Printed Material .....	.934
<i>E.M. Dzierzak, M.S.L.S., K. Hayes, and W. Lucas</i>	
The Nightingale Tracker™ .....	.935
<i>V.L. Elfrink, R.N., Ph.D.</i>	
Word Search Performance of Free-Text Electronic Patient Records by Surgical Diagnoses in a Veterinary Medical Teaching Hospital Clinical Database .....	.936
<i>L. Estberg, D.V.M., M.P.V.M., Ph.D., J. Case, D.V.M., Ph.D., R. Walters, Ph.D., R. Cardiff, M.D., Ph.D., and L. Gallupo, D.V.M.</i>	
Perceived Usefulness of Decision Support: The StrokeNet Experience .....	.937
<i>A. Fish, M.H.Sc., K. Rajkumar, H.R.T., M.W. Morgan, M.D., and F.L. Silver, M.D.</i>	
An Easy to Use Tool for Creating and Maintaining User Dialogs .....	.938
<i>M.J. Franklin, D.F. Sitting, Ph.D., M.D. Paterno, R.D. Zielstorff, R.N., M.S., and J.M. Teich, M.D., Ph.D.</i>	
Embedding a Web-Browser in an Order Entry System to Improve the Distributed Maintenance of Decision-Support Resources .....	.939
<i>A.J. Geissbuhler, M.D., and J.F. Grande</i>	
Producing Prescription Labels for Individuals with Limited English Proficiency .....	.940
<i>P. Gleich, M.D.</i>	
Supported Self-Care: Integrated Technological Solution to Cost-Effectively Manage the Chronically Ill .....	.941
<i>D.C. Goodman, M.D., and B. Kendall, Ph.D.</i>	
A Multidimensional Decision Support System for Hospital Management .....	.942
<i>D.B. Gordon, M.Sc., R. Chapman, and S. Marafioti</i>	
Assessing the Information Needs of Community-Based Primary Care Clinicians: Effect of Interviewer Training and Status .....	.943
<i>P.N. Gorman, M.D., J.S. Ash, Ph.D., and S.B. Poulsen, Ph.D.</i>	
A Visual Method for Input of Uncertain Time-Oriented Data .....	.944
<i>M. Goyal, and P. Szolovits, Ph.D.</i>	
NACIS: World Wide Web Access to Computerized Patient Records .....	.945
<i>R.R. Hausam, M.D., and J.B. Olson, M.D.</i>	
Using Computer Technology to Enhance Diabetic Disease Management in a Large Multi-Specialty Practice ..	.946
<i>V.M. Heckel, M.P.H., and R. Burns</i>	

Physician Charting of Coded Emergency Room X-Ray Interpretations Using CARI (Computerized Assistant for Radiology Interpretation) .....	.947
<i>L.K. Heermann, R.N., M.S., R.M. Sailors, M.E., T.D. East, Ph.D., C.J. Wallace, R.N., M.S., R.L. Bradshaw, B.S., A. Lugo, B.S., and R. Greenlee, M.D.</i>	
The Vanderbilt Perioperative Information Management System Forms Foundation for Outcomes Management .....	.948
<i>M.S. Higgins, M.D., C. Beattie, Ph.D., M.D., P. St. Jacques, M.D., N. Patel, M.S., J. Yarborough, M.S., and Y.S. Tsai, Ph.D.</i>	
Educational Support for Rural Physicians: A Testbed for the Development of Mixed Media CME in Newfoundland .....	.949
<i>T.B. Hoekman, Ph.D., C. Michalski, Ph.D., V. Curran, M.Ed., W. Gulliver, M.D., I. Landells, M.D., and K. Wilson, Ph.D.</i>	
Redesigning and Adapting A Concept of Quality Management in Oncology .....	.950
<i>S. Hoelzer, M.D., Ph.D., and J. Dudeck, M.D., Ph.D.</i>	
User-Interface Design of a Web-Based Clinical Decision Support System .....	.951
<i>M. Hulse, R.N., R.D. Zielstorff, R.N., M.S., and G. Estey, Ed.M.</i>	
The Electronic Toolkit: Providing View-Based Reference Materials .....	.952
<i>K.N. Ibrahim, D.S. Ketchell, M.L., P. Tarczy-Hornoch, M.D., and S. Rauch, M.L.</i>	
Identifying Hospital Admissions Due to Adverse Drug Events: Using a Computer-Based Monitor .....	.953
<i>A.K. Jha, M.D., G.J. Kuperman, M.D., Ph.D., E. Rittenberg, M.A., L.L. Leape, M.D., J.M. Teich, M.D., Ph.D., B. Shea, Pharm.D., and D.W. Bates, M.D., M.Sc</i>	
An Internet-Based Patient Interview .....	.954
<i>P.C. Jones, F.J. van Wingerde, drs., and C. Safran, M.D., M.S.</i>	
Supporting Postcoordination in an Electronic Problem List .....	.955
<i>K.D. Keck, K.E. Campbell, M.D., Ph.D., C.G. Chute, M.D., Dr.P.H., P.L. Elkin, M.D., M.S. Tuttle, and W.G. Cole, Ph.D.</i>	
DxAbx—A Computerized Tool to Aid in the Appropriate Selection of Antibiotics: Development and Use on a Local Area Network .....	.956
<i>R.J. Kiel, M.D.</i>	
A Decision-Support System For Warfarin Management: Follow-Up Report .....	.957
<i>M. Kierszenbaum, M.D., A. Margolis, M.D., M.S., G. Varela, M.D., R. Tarlera, M.D., L. Munoz, M.D., N. Tavella, M.D., and J. Torres, M.D.</i>	
Quality Improvement Workstation on the World Wide Web .....	.958
<i>S. Krishna, Ed.S., T.B. Patrick, Ph.D., E.A. Balas, M.D., Ph.D., and F. Crippa</i>	
An Intelligent Groupware Environment for Real-Time Distributed Medical Collaboration .....	.959
<i>C.A. Kulikowski, Ph.D., L. Gong, Ph.D., and S. Chang, M.S.</i>	
Computers in Medical Education: A New Requirement for Students .....	.960
<i>A.R. Kwak, Ed.D., E. Kumpart, A. Relan, Ph.D., R. Trelease, Ph.D., and N. Parker, M.D.</i>	
Evaluation of Internet-Based Distance Education for Dentists .....	.961
<i>W.P. Lang, D.D.S., M.P.H., K.L. Gould, R.D.H., M.P.H., P.S. Richards, D.D.S., M.S., and L.V. Nyquist, Ph.D.</i>	

A Relational Database Application: The Glaucoma Tables of the American Society of Cataract and Refractive Surgery (ASCRS) National Outcomes Database Library .....	.962
<i>J.P.K. Lim, Ph.D., W. Steger, M.S., N. Wicklin, R.N., M.S., and J. Abrams, M.D.</i>	
Medical Applications of Distributed Multimedia Database System on the Internet .....	.963
<i>L. Liu, Ph.D., Y.C. Li, M.D., Ph.D., and S. Pan, M.D., Ph.D.</i>	
Integrative Web Sites for Disease Management Program Evaluation .....	.964
<i>R. Lucas, M.S., W.C. Liao, Ph.D., and F.A. Bryan, Ph.D.</i>	
Against Search Engines in Primary Care: A Model for Organizing POEMs in the WWW Environment .....	.965
<i>S.L. MacCall, M.S.I.S., J.A. Whitham, D.O., and H. McNulty, D.O.</i>	
Disease Management System - A Successful Development and Implementation .....	.966
<i>K.F. Malbin, R.N., M.B.A., K. Lewis, S.G. Prabu, J.P. Curtin, M.D., M.E. Dowling, R.N., M.N.A., W.L. Carroll, M.A. McLaughlin, S. Kelson, K.C. Conlon, M.D., P.G. Maslak, M.D., T.N. Robinson, F. Bangs, M. Hamilton, W. Cheng, Ph.D., J.B. Dougherty, M.D., W.J. Hoskins, M.D., and C. McCollum,</i>	
Use of Wireless Communication by Handheld Pen-Based Computers to Cut Medical Costs and Improve Health Care .....	.967
<i>A.R. Malek, M.D., N. Coblio, M. McCormick, M.S., and W.S. Harris, M.D.</i>	
A JAVA-Based Tool for Remote Access to Emergency Protocols .....	.968
<i>V. Maojo, M.D., Ph.D., L. Villalonga, M.D., Ph.D., J. Crespo, Ph.D., R. Cuadrardo, N. Perez, F. Martin, Ph.D., and A. Pazos, M.D., Ph.D.</i>	
AEGIS: A User-Friendly, Data-Entry Model for Prenatal Computerized Patient Records .....	.969
<i>R.S. Marcus, M.D.</i>	
RUDICS: An Information Network for the Health Sciences in Uruguay .....	.970
<i>U. Bartram, A. Arcia, S. Arraga, C. Ferreira, R. Filgueira, S. Launy, and F. Simini</i>	
Design Considerations for an Alert System to Prevent Inpatients Falls .....	.971
<i>H.F. Marin, Ph.D., R.N., P.Q. Bourie, M.S., R.N., S. Goihman, Ph.D., M.D., M. McKay, C. Safran, M.D., and R.H. Chapman, M.S., R.N.</i>	
Mutual Involvement of Information System, Users and Context: The Influence on the Acceptance of a Hospital Information System .....	.972
<i>M.C. Mazzoleni, Dr.Ing., P. Baiardi, Dr.Math.Sc., I. Giorgi, Dr.Psyc.Sc., G. Franchi, P.I., M. Cortesi, P.I., and F. Sozze, P.I.</i>	
Developing a Robust WWW Interface to Scholarly Databases: HTML (PHP+mSQL+Open Web) = Increased Functionality .....	.973
<i>F.M. McGrath, M.L.S., R.R.T., and K. Latimer</i>	
Demonstration of Computer-Based Forecasting for Childhood Immunization and Related Knowledge Maintenance Tools .....	.974
<i>P.L. Miller, M.D., Ph.D., S.J. Frawley, Ph.D., F.G. Sayward, Ph.D., and W.A. Yasnoff, M.D., Ph.D.</i>	
Improving Continuity of Care Using a Web Based Signout and Discharge Summary System .....	.975
<i>C. Moore, M.D., and J. Kannry, M.D.</i>	

Diagnostic Quality of Endoscopic Images in a Telemedicine Application	976
<i>P.L. Moses, M.D., M. Ricci, M.D., J. McGowan, Ph.D., and P. Callas, Ph.D.</i>	
A Clinical Telemedicine Consultation System Incorporating Evaluative Research	977
<i>C.A. Motta, M.S., E. Gomez, M.D., C. Naulty, M.D., R.K. LaChance, D.N.S., R. Poropatich, M.D., M.R. Micheals, D. Robie, M.D., B. Darling, M.D., R. Parry, M.D., M. Cannon, R.N., and J. Richter</i>	
The Unified Electronic Patient Record Project (UEPR): Integrating University Hospitals in Sao Paulo	978
<i>L. Moura, Ph.D., B.F. Leao, M.D., Ph.D., M. Biczyk, M.D., Ph.D., and D. Sigulem, M.D., Ph.D.</i>	
Proof-of-Concept Process: Web Access to Research Protocols On-Line	979
<i>W.S. Noble, O.S. Butler, M.A., A. Jimenez, T. Odom-Maryon, Ph.D., and J.C. Niland, Ph.D.</i>	
Biosoftware - Software for the Teaching and Learning of Health Topics	980
<i>M.A. Novaes, Ph.D., A.H.F. Carvalho, A.P. Araujo, and J.L.L. Filho, Ph.D.</i>	
Traditionally Trained Medical Students' Perceptions of the World Wide Web as a Source of Clinical Information	981
<i>C. Odlum, Mb., Dip. IT, D. O'Donnell, Mb., H. Moore, Mb., and M.X. Fitzgerald, M.D.</i>	
A Team Approach to Information Policy Development	982
<i>A.J. Olsen, M.B.A., M.A., R.B. Borden, R.N., M.G. Reeves, R.R.A., W.W. Stead, M.D., D.A. Giuse, Dr.Ing., and K.W. Emerson, M.B.A., M.S.</i>	
Evaluating Barrier-Free Access to Teen Health Information on the Web	983
<i>G.I. Paterson, M.Sc., and D.J. Langille, M.A.</i>	
Exploratory Data Analysis to Detect Preterm Risk Factors	984
<i>J.C. Prather, M.S., D.F. Lobach, M.D., Ph.D., M.S., J.W. Hales, Ph.D., L.K. Goodwin, R.N., Ph.D., M.L. Hage, M.D., D.A. Nagey, M.D., Ph.D., and W.E. Hammond, Ph.D.</i>	
Comparing Primitive Concept Fields in Clinical Terminologies	985
<i>C. Price, M.Phil., P.J.B. Brown, M.R.C.G.P., and E.B. Schulz, M.B.</i>	
Journal Extracts: Task-Oriented Views of the Medical Literature	986
<i>G.P. Purcell, M.D., Ph.D., W.M. Detmer, M.D., M.Sc., and F.F. Davidoff, M.D.</i>	
The quizCGI System Interactive Testing Over the Internet	987
<i>R. Rathe, M.D., G. Cornwall, M.Ed., and F. Lin, M.S.</i>	
From Lectures to the World Wide Web: Some Instructional Design Considerations	988
<i>A. Relan, Ph.D., and T. Drake, M.D.</i>	
Confidentiality of Medical Records in the W3-EMRS Project	989
<i>D.M. Rind, M.D., I.S. Kohane, M.D., P. Szolovits, Ph.D., C. Safran, M.D., H.C. Chueh, M.D., and G.O. Barnett, M.D.</i>	
Remote Delivery of Real-Time Physiologic Data Over the World Wide Web	990
<i>M.F. Rodriguez, and F.W. Stitt, M.D.</i>	
Usefulness of the World Wide Web to Primary Care Clinicians: A Pilot Study	991
<i>F.B. Rohlmann, and P.N. Gorman, M.D.</i>	

Using CORBA and Speech Recognition for Structured Medical Reporting .....	.992
<i>D.F. Rosenthal, and J. Mayo</i>	
DOES: Selecting a Subject Diagnosis .....	.993
<i>G. Roshwalb, M.D., and J. Kannry, M.D.</i>	
A Model of Time-Critical Decision Making .....	.994
<i>G.W. Rutledge, M.D., Ph.D.</i>	
The Transfer of Adverse Clinical Events Rules with an Arden-Based Decision Support System .....	.995
<i>J.T. Sager, Ph.D., R. Corman, D. Daine, M.A., J. Wu, Ph.D., M. Yang, M.D., M.S., N. Thalman, and S. Wang, Ph.D.</i>	
MLM Builder: An Integrated Suite for Development and Maintenance of Arden Syntax Medical Logic Modules .....	.996
<i>R.M. Sailors, M.E.</i>	
An Intrahospital Information System Supporting Immediate Pathological Diagnosis and Decision-Making During Surgery .....	.997
<i>T. Sakamaki, M.D., T. Fukusato, M.D., Y. Nakazato, M.D., and Y. Kitani, M.D.</i>	
Drug Allergies and Reactions Program: A New Paradigm to Record Complete Information .....	.998
<i>D.Z. Sands, M.D., M.P.H., R.H. Chapman, M.S., R.N.C., S. Goodman, D.M. Rind, M.D., M.S., and C. Safran, M.D., M.S.</i>	
Impact of Hypertext, Intranet and Internet Technologies on Usage of Pathways in Clinical Medicine .....	.999
<i>S.I. Sayegh, M.D., Ph.D., S. Phillips, M.S.L.S., and R.J. Kiel, M.D.</i>	
Prospective Indexing for Enhanced Retrieval of Medical Documents on the World Wide Web	1000
<i>C.L. Schell, M.L.S., M.D., and R.J. Rathe, M.D.</i>	
First Experiences with a Simple Patient INTERNET Program for Drug Risk Checking	1001
<i>W.U. Scholz, J.M. Banaticla, M.D., and A.L. Mardis, M.D., M.P.H.</i>	
A Simple, Maintainable System for Identifying Subsets of a Modern Controlled Vocabulary	1002
<i>E.B. Schulz, M.B.B.S., J.W. Barrett, M.Sc., M.B.B.Chir., A.R. Maclean, and P.J.B. Brown, M.R.C.G.P</i>	
An Expert System for Counseling Patients to Stop Smoking	1003
<i>C.N. Sciamanna, M.D., M.P.H., and D.E. Ford, M.D., M.P.H.</i>	
SecondOpinion: Interactive Web-Based Access to a Decision Model	1004
<i>G.C. Scott, D.J. Cher, M.D., and L.A. Lenert, M.D.</i>	
An Automated System for Film Processor Quality Control	1005
<i>R.D.C. Shearer, and D.R. Shearer, Ph.D.</i>	
A Novel Computer Interface for Echocardiographic Reporting	1006
<i>J.S. Soble, M.D., R.H. Hwang, M.S., P. Lu, Ph.D., and J. Roberge, Ph.D.</i>	
Laboratory on the Internet	1007
<i>R.L. Summers, M.D., and T.G. Coleman, Ph.D.</i>	

Implementing the United States Preventive Services Task Force Guidelines Using an Interactive Computer System	1008
<i>G.H. Tabas, M.D., and W. Horn</i>	
Successful Integration of Patient Care and Administrative Functions	1009
<i>G.P. Thomas, M.D., and M. Krol, Ph.D.</i>	
Implementation of a Multidisciplinary Patient Problem List: Planning and Organizational Issues	1010
<i>J.R. Thompson, R.A. Stoupa, M.S.N., K. Sorrentino, R.N., J.M. Carrothers, M.B.A., R.R.A., and J.R. Campbell, M.D.</i>	
Java and the Internet: Bridges to Independence from Legacy Systems	1011
<i>T.P. Tinnell, A. Geissbuhler, M.D., and R.A. Miller, M.D.</i>	
Applications of Mixture Models to MR Angiography	1012
<i>M.A. Tovar, M.S., and P. Dev, Ph.D.</i>	
An Alternative Way to Construct and to Evaluate Educational Software	1013
<i>R.M. Volpe, M.T.B. de Aquino, and D.Y.J. Norato, Ph.D.</i>	
Perioperative Information via the Web Enables Efficiency in Patient Care	1014
<i>L.R. Waitman, M.S. Higgins, M.D., P.H. King, Ph.D., M.L. Miller, and N.P. Patel, M.S.</i>	
Tele-Reporting for Cost-Effective Public Health	1015
<i>B.D. Hall, M.A., M.B.A., G.B. Abbott, M.D., G. Doeberl, M.A., J.E. Sander, and J.M. Walsh, M.A.</i>	
Implementation Issues of a Critical Care Computer-Based Patient Record: A Formative Evaluation	1016
<i>J.J. Warren, Ph.D., R.N., R. Halbach, R.N., J. Cuddigan, M.S.N., R.N., and K. Azevedo, R.N.</i>	
Using Palmtop Computers to Retrieve Clinical Information	1017
<i>A.B. Wilcox, M.A., G. Hripcak, M.D., and C.A. Knirsch, M.D., M.P.H.</i>	
Working Toward Acceptance of a Physician Order Entry System	1018
<i>P. Winslow, R.N., J.E. Smith, R.N., C. Dolan, R.N., M.S.N., P. Ardolino, R.N., M.A.S., S. Ray, M.D., S. Mandell, M.S., S. Reel, M.B.A., M. Weiner, M.D., and T. Gress, M.D.</i>	
A Pilot Task-Oriented Evaluation of Evidence-Based Medicine Databases	1019
<i>M.P. Zacks, M.D.</i>	
Creating an Ambulatory Integrated Computerized Medical Information System: Joint Development by Client and Vendor	1020
<i>J.A. Zapp, M.D., R.J. Carroll, and H.C. Mullins, M.D.</i>	
Applications of a Decision Support System to Medical Staff Evaluations	1021
<i>E.J. Zarling, M.D., F.A. Piontek, M.A., R. Polk, M.D., T.T. Vogel, M.D., Ph.D., T. VanOsdol, M.A., M.S., and H.J. Groot</i>	
Conceptual Modeling Techniques for Online Curriculum Design	1022
<i>J. Zucker, M.A., H. Chase, M.D., P. Molholt, M.L.S., E. Soliz, and R.M. Kahn, Ph.D.</i>	

Section XI Theater-Style Demonstrations

Theater-Style Demonstration: The Indy VA Clinical Workstation: Real Movement Toward an Electronic Medical Record	1024
<i>J.R. Roskam, M.D., M.B.A., M.R. Cox, T.D. Davis, and P.L. Salmon</i>	
Theater-Style Demonstration: EON: CORBA-Based Middleware for Automation of Protocol-Directed Therapy	1025
<i>M.A. Musen, M.D., Ph.D., S.W. Tu, M.S., A. Advani, M.D., A.K. Das, M.D., Z. Hasan, M.S., J. Nguyen, and Y. Shahar, M.D., Ph.D.</i>	
Theater-Style Demonstration: Using an Inexpensive Integrated Multimedia Hospital Patient Database Workstation Combining Text/Imaging with Telecommunications and Internet-Cardiology's Experience	1026
<i>R.D. Fletcher, M.D., M.A. Coyle, R.A. Dayhoff, M.D., D.A. Lu, M.D., K.L. Crawford, C.M. Wu, C. McManus, M.A., and R.E. Jones, M.S.E.E.</i>	
Theater-Style Demonstration: The Regenstrief Medical Record System 1997: A System for Clinical, Pervasive and City-Wide Computing	1027
<i>C.J. McDonald, M.D., J.M. Overhage, M.D., Ph.D., W.M. Tierney, M.D., P. Dexter, M.D., B. Takesue, M.D., B. Smith, R.N., T. Hogan, R.N., L. Blevins, J. Warvel, J. Warvel, J. Meeks-Johnson, L. Lemmon, T. Glazener, A. Belsito, D. Lindbergh, B. Williams, P. Cassidy, D. Xu, and M. Tucker</i>	
Theater-Style Demonstration: The Web Enabled IHC Enterprise Data Warehouse for Clinical Process Improvement and Outcomes Measurement	1028
<i>P. Wang, M.S., A. Pryor, Ph.D., S. Narus, Ph.D., R. Hardman, and M. Deavila</i>	
Theater-Style Demonstration: Use of an Enterprise-Wide Electronic Patient Record	1029
<i>S.F. Mandell, M.S., M.L.A., S. Reel, M.B.A., and S. Szekalski</i>	
Theater-Style Demonstration: Clinical Computing at the Beth Israel Deaconess Medical Center	1030
<i>J.D. Halamka, M.D., D.M. Goldsmith, R.N., M.S., P.Q. Bourie, M.S., R.N.C., J.S. Einbinder, M.D., H.F. Marin, Ph.D., R.N., D.Z. Sands, M.D., M.P.H., D.M. Rind, M.D., M.P.H., R.J. Chapman, M.S., R.N.C., and C. Safran, M.D., M.S.</i>	
Theater-Style Demonstration: Collaborative Development of a Computer-Based Patient Record with a Commercial Vendor-Progress Report at Two Years	1031
<i>J.R. Campbell, M.D., J. Veline, M.B.A., D. Hilton, R.N., C. Sorrentino, R.N., J.H. Sisson, M.D., and J. Bahensky, M.S.</i>	